Name _____ AP Chemistry

Expressing Concentration Practice

1) Ascorbic acid (vitamin C, $C_6H_8O_6$) is a water-soluble vitamin. A solution containing 80.5 g of ascorbic acid dissolved in 210 g of water has a density of 1.22 6/mL at 55°C. Calculate (a) the mass percentage, (b) the mole fraction, (c) the molality, and (d) the molarity of ascorbic acid in this solution.

2) Calculate the number of moles of solute present in each of the following solutions:
   (a) 600 mL of 0.250 $SrBr_2$
   (b) 86.4 g of 0.180 m KCl
   (c) 124.0 g of a solution that is 6.45% glucose ($C_6H_{12}O_6$) by mass

3) Which of the following in each pair is likely to be more soluble in water? Explain in each case.
   (a) Cyclohexane (C_6H_{12}) or glucose ($C_6H_{12}O_6$)
   (b) Propionic acid (CH_3CH_2COOH) or sodium propionate (CH_3CH_2COONa)
   (c) HCl or ethyl chloride (CH_3CH_2Cl)?

4) Brass is a substitutional alloy consisting of a solution of copper and zinc. A particular sample of red brass consisting 80.0% Cu and 20.0% Zn by mass has a density of 8750 kg/m^3. (a) What is the molality of Zn in the solid solution? (b) What is the molarity of Zn in the solution?

5) In lab you need to prepare at least 100 mL of each of the following solutions. Explain how you would proceed using the given information.
   (a) 2.0 m KCl in water (density of water = 1.00 g/mL)
   (b) 15% NaOH by mass in water
   (c) 25% NaOH by mass in CH_3OH (d = 0.79 g/mL)
   (d) 0.10 mole fraction of $C_6H_{12}O_6$ in water

6) Which solvent, water or hexane (C_6H_{14}), would you choose to dissolve each of the following?
   (a) NaCl
   (b) HF
   (c) Octane (C_8H_{18})
   (d) $(NH_4)_2SO_4$